Chagas’ Disease in non-Endemic Countries

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Apparent distribution of *Triatoma infestans*
Migration flow of immigrants from endemic countries of T. cruzi, estimates of infected individuals, and the potential number of individuals that may develop Chagas disease in the destination countries.

Schmunis and Yadon (2010)
Update of the world map: Chagas’ disease (Trypanosoma cruzi)
Epidemiological information update - Europe

Distribution of cases of *T. cruzi* infection in Europe by country, and reported transmission among the European population (data reported to WHO as of Dec 2009)
The distribution of Latin American in Japan (2007)

<table>
<thead>
<tr>
<th>Country</th>
<th>(10^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>313 (79.5%)</td>
</tr>
<tr>
<td>Peru</td>
<td>59 (15%)</td>
</tr>
<tr>
<td>Bolivia</td>
<td>6 (2%)</td>
</tr>
<tr>
<td>Argentine</td>
<td>4 (1%)</td>
</tr>
<tr>
<td>Paraguay</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>7 (2%)</td>
</tr>
</tbody>
</table>
Increase rate of Brazilian in Aichi prefecture

Increase rate of Brazilian in Aichi prefecture

### Serologic examination for T.cruzi from 1999 to 2006 in School of Medicine, Keio University

<table>
<thead>
<tr>
<th>Age</th>
<th>M</th>
<th>F</th>
<th>Mother country</th>
<th>Seropositive/examined</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ 10</td>
<td>1</td>
<td>2</td>
<td>Brazil, Japan</td>
<td>0/3</td>
</tr>
<tr>
<td>11~20</td>
<td>0</td>
<td>1</td>
<td>Brazil</td>
<td>0/1</td>
</tr>
<tr>
<td>21~30</td>
<td>2</td>
<td>4</td>
<td>Brazil</td>
<td>1*/6</td>
</tr>
<tr>
<td>31~40</td>
<td>2</td>
<td>2</td>
<td>Brazil(1/3), Argentine(1)</td>
<td>1/4</td>
</tr>
<tr>
<td>41~50</td>
<td>4</td>
<td>4</td>
<td>Bolivia(2), Brazil(4/6)</td>
<td>6/8</td>
</tr>
<tr>
<td>51~60</td>
<td>1</td>
<td>4</td>
<td>Brazil(3/4), Japan(1)</td>
<td>3/5</td>
</tr>
<tr>
<td>61~70</td>
<td>1</td>
<td>2</td>
<td>Japan-Bolivia(1), Peru(1), Brazil(1)</td>
<td>2/3</td>
</tr>
</tbody>
</table>

9 out of the total 30 examined were suspected to suffer from the outbreak of Chagas’ disease in St Catalina in 2005 Caridiomyopathy suspected 13/21 (62%) * Infected through transfusion in Brazil
**Background Information on 13 Seropositives for T. cruzi Infection in Japan**

<table>
<thead>
<tr>
<th>Description</th>
<th>Count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know what is Chagas’ disease</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Chagas’ disease patient in family</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>History of blood donation or transfusion</td>
<td>1/3</td>
<td>1=donated blood in Japan (1999)</td>
</tr>
<tr>
<td>Had a contact with triatomine bug</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Wooden house + thatched roof</td>
<td>7</td>
<td>*</td>
</tr>
<tr>
<td>House with lay wall</td>
<td>3</td>
<td>*</td>
</tr>
<tr>
<td>Brick house</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Current donor selection and donation screening practices in some non-endemic countries

- Spain*
- Italy*
- France*
- UK*
- USA

Note: Further data to become available by end of 2011 as part of WHO Global Blood Safety Database

United States

- Widespread serological screening of blood donations from Jan 2007 now covers 70-90% of blood supply (not plasmapheresis)
- Most centres screen all donations but a small number only screen “at-risk” donors
- Since Jan 2007, 799 confirmed seropositive donations in 42 states
- 5 solid organ transplant associated cases documented
- 5 transfusion-associated transmissions documented (all were immunosuppressed)

(Source: Wendel, 2010)
No binding requirements, “note for guidance” only issued.
Guidance is for whole blood only and not human cells, tissues or source plasma

Donor selection
- Ask donors “Have you ever had Chagas disease?”
- Donors that answer “Yes” and those that test repeat reactive on a licensed test should be permanently deferred and notified of their deferral within 8 weeks
- Notification should include explanation of possibility for cross-reactivity with e.g. Leishmania
- All donors that test repeat reactive should be counselled to seek a physicians advice and it may be useful to refer them to their state and local health departments or to other appropriate community resources
EU Guidance

No mandatory requirement (such as an EU Directive), each Member State determines its own rules

Detailed EU technical guidance under Donor Deferral as follows:

- Conditions leading to permanent deferral:
  - “…, Chagas disease, …”

- Conditions requiring individual assessment:
  - In some countries donors who were born or have been transfused in areas where the disease is endemic are deferred or tested. The blood of persons who were born or who have been transfused in areas where the disease is endemic should be used only for plasma fractionation products unless a validated test for infection with *T. cruzi* is negative

Source: Council of Europe “Guide to the preparation, use and quality assurance of blood components” (16th Edn)
Donors permanently deferred if

- Born, mother born or had a blood transfusion in South America or Central America (including Southern Mexico but excluding Caribbean islands)
- Lived and/or worked in rural subsistence farming communities in above countries continuously for 4 weeks or more Donor deferred until 6 months has elapsed since last exposure and a validated test for *T. cruzi* antibody is negative
- Commercially available ELISA and in-house IFA test kits used for screening

**Organs, tissues and cell transplantation**
- Only known Chagas disease patients excluded
Spain

Epidemiological data (2009)
- Estimated number of South American migrants: 1.4M
- Estimate number of cases of *T. cruzi* infection: 40K – 65K

Congenital transmission
- No systematic detection of congenital infection at national level

Blood donation
- National systematic transfusion transmission prevention not in place
- Blood donor questionnaire seeks to identify at-risk individuals
- Mandatory screening since October 2005 of following at-risk blood donors:
  - Born in endemic area
  - Born to mothers born in endemic area
  - Recipient of blood transfusion in endemic area
- Although not mandated, blood banks also screen individuals that have resided in endemic areas
- Blood banks use commercial (mostly ELISA) based tests
Current barriers and trials to solve the problems in Japan

Social Problems South American immigrants
(1) Low rate of enrollment in primary and secondary schools
(2) Low enrollment in health insurance
(3) Language gap
(4) Isolation in community; sometimes crime commitment
(5) Lack of appropriate law helping immigrants
(6) Leading to inappropriate discrimination

Against T. cruzi infection
(1) Lack of nation-wide surveillance system, even at blood donation/transfusion
(2) Number of laboratory responsible for serodiagnosis or PCR: currently only one
(3) Lack of knowledge and skills among doctors and medical professionals
(4) Lack of appropriate drug: Orphan drug research group has only Lampit

But
(1) Japanese MLHW has organized more than 2 research groups for surveillance of T. cruzi infection among South American immigrants and examination of donated blood
(2) Some attempts are being done to promote immigrants into Japanese community including education, language, health insurance, legal status etc